# PERSPECTIVE

# Publications of W.M. Porterfield Jnr. on Weeds of Shanghai: A Review

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## Abstract

This paper provides a brief review of the botanical contributions of W. M. Porterfield (1893-1966), focusing on a list of 115 plants, including many weeds, 75 of which he described and illustrated in a series of articles and later published in a book with descriptions of an additional 40 plants. His meticulous observations are of great interest in the study of weed biology and history. All plants were collected in Shanghai.

Key words: W. M. Porterfield, Botanist, Shanghai

# Introduction

Willard Merritt Porterfield (1893–1966) received his M.A. in 1915 from Franklin & Marshall College, Lancaster, Pennsylvania, USA, and began his career as a teaching missionary in China, where he served in the faculty of St. John's University of Shanghai. His biographical details have been obtained from Merrill and Walker (1938); The NY Times (1966) and Stafleu and Cowan (1983).

It was in China that he developed his strong interest in plants. He wrote on trees, shrubs and herbs, and a booklet on bamboo. One of his earliest publications (Porterfield Jr., 1922) was concerned with algae in the Chinese classics. After his experiences in China, he returned to the USA, where he worked at Vermont University Agricultural Research Station, the New York Botanical Garden, and the Soil Conservation Service of the US Department of Agriculture.

Porterfield wrote a number of articles on Chinese food plants in *The Journal of the New York Botanical Garden*, which are all referenced in Porterfield Jr. 1951. He is most cited for his paper on the botany and utilization of Sponge gourd or loofah – *Luffa cylindrica* Roem. (Porterfield Jr 1955).

There are two of his works to which I wish to draw special attention. They are:

1. A series of ten articles entitled "Lawn and Roadside Plants of Shanghai", which appeared across 10 instalments in Volume 16 (pp. 32–40,95–100, 140–145, 197–204), Volume 17 (pp. 136–142, 238–244, 305–314) and Volume 19 (pp. 82–90, 145–151, 259–267) of *China Journal* (Shanghai), published in 1932 and 1933.

2. The book *Wayside Plants and Weeds of Shanghai*, published by Kelly & Walsh in Shanghai, Hong Kong, and Singapore in 1933.

The series covers 75 different plants, each with illustrations. I used the series during my preparation of a Working List of Weeds of the Asia-Pacific Region, which I prepared for the 7<sup>th</sup> Asian-Pacific Weed Science Society (APWSS) Conference in Sydney in 1979 (Michael, 1979), and again, recently, during a search for early Chinese records of *Oxalis debilis* Kunth (syn. *O. corymbosa* DC., *O. martiana* Zucc.).

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These plants are listed again in Porterfield's book, along with 40 additional plants, bringing the total number to 115, all with illustrations according to descriptions of the book in the bibliography of Needham's *Science and Civilisation in China* (Vol. VI, Part 1) and notes about the book in the National Library Board Catalogue, Singapore. This rare book is an important early work in English referring to weeds in China, which, regrettably, I have not been able to see.

Porterfield obviously had a strong feeling for weeds as he often regretted not getting to the fields soon enough to collect plants before they were mown or slashed. He took identification of his plants very seriously. In his descriptions of plants, he always mentions the date of collection, and he needed good specimens for his illustrations.

I do not know whether his collections of Chinese plants are held in Chinese herbaria. He made good use of important botanical publications dealing with far eastern plants, especially Bentham's *Flora Hongkongensis* (Bentham, 1861) and Merrill's *Flora of Manila* (1912). Porterfield also sought help from

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many other botanists concerned with plants in China, notably A. N. Steward in Nanjing (Nanking), the author of *Manual of Vascular Plants of the Lower Yangtze Valley, China* (Steward, 1958) <sup>1</sup>. He also drew attention to Nathaniel Gist Gee (1876-1937), sometime Professor of Natural Science at Suzhou (Soochow) University.

In this brief article, I list the 75 plants featured in the series. In cases where the botanical name has changed, I list the current name first, followed by the name as it appeared in Porterfield's article. It has been difficult at times to be sure of the identity of the plants. Sometimes the Chinese characters presented by Porterfield have been helpful.

After accessing a digital copy of Porterfield's "Systematic Classification of the Species", the list that introduced his book, I have also been able to add the names of the 40 additional plants, to present the complete listing of **115** (Table 1). The additions from the book are marked in Table 1. I have again noted changed names, listing the current names above those, as noted by Porterfield (1933).

# = plants listed in Porterfield's book, additions to original list in article series Monocotyledons		
Commelinaceae	Commelina communis L.	
Cyperaceae	Cyperus eragrostis Vahl	
	C. rotundus L.	
Iridaceae	# Iris japonica Thunb.	
Liliaceae	Allium chinense G. Don	
	Barnardia japonica (Schult.f.) Roemer & Schultes, as Scilla chinensis Benth.	
Orchidaceae	Spiranthes australis Lindl.	
Poaceae (Gramineae)	# Alopecurus aequalis Sobol., as A. geniculatus L.	
	Cynodon dactylon Pers.	
	Digitaria ciliaris (Retz.) Koeler, as D. sanguinalis Scop. var. ciliaris Doell	
	# Echinochloa crus-galli (L.) Beauv.	
	Eleusine indica Gaertn.	
	# Elymus caninus (L.) L., as Agropyron caninum (L.) Beauv.	
	Eragrostis cilianensis (All.) Link	
	Eremochloa ophiuroides Hack.	
	# Imperata cylindrica (L.) Beauv.	

#### Table 1. List of Plant Species

H.M. Gilkey (1959). "Albert Newton Steward", Bulletin of the Torrey Botanical Club, 86(5): 342-344.

<sup>&</sup>lt;sup>1</sup> For details on Albert N. Steward – see: (1) <u>http://scarc.library.oregonstate.edu/findingaid</u> <u>s/?p=collections/findingaid&id=1052</u>); and (2)

## Table 1 (continued). List of Plant Species

# = plants listed in Porterfield'	s book, additions to original list in article series
	Paspalum scrobiculatum L.
	Pennisetum alopecuroides (L.) Spreng.
	Poa annua L.
	Setaria viridis Beauv.
	Zoysia japonica Steud., as Z. pungens Willd.
Dicotyledons	
Acanthaceae	Rostellularis procumbens (L.) Nees, as Justicia procumbens L.
Amaranthaceae	Amaranthus cruentus L., as A. paniculatus L.
	A. spinosus L.
	Achyranthes bidentata Blume
Apiaceae (Umbelliferae)	# Cnidium monnieri (L.) Spreng., as Selinum monnieri L.
	# Torilis japonica (Houtt.) DC., as <i>T. anthriscus</i> (L.) Bernh.
Asteraceae	Artemisia vulgaris L.
//0/0100000	Carpesium cernuum L.
	Chrvsantheumum indicum L.
	# Cirsium arvense (L.) Scop.
	# C. japonicum DC.
	# Convza bonariensis (L.) Crong., as Erigeron linifolius Willd.
	C. canadensis (L.) Crong.
	# Crepis japonica Benth.
	Fclipta prostrata (L.) L., as F. alba Haenk.
	Frigeron annuus (L.) Pers
	Fupatorium japonicum Thunb.
	# Hieracium crocatum Fries
	# Inula britannica L
	Kalimeris indica (L.) Schultz-Bin as Boltonia indica Benth
	# Saussurea carthamoides Benth
	# Sonchus asper (L) Hill
	Tarayacum officinale Weber
Deveringener	Trigonotis peduncularis (Trevir.) Benth
Bragginaceae (Crugiforge)	Capsella bursa-pastoris (L.) Medikus
Brassicaceae (Cruciferae)	# Cardamina flavuosa With as C hirsuta L var svlvatica Hook
	# Lepidium didymum L as Coronopus didymus (L) Smith
	Rorinna indica (L.) Hieron, as Nasturtium montanum Wall
	Arenaria serovilifolia l
Caryophyllaceae	Corastium domoratum Thuill as Chviscosum I
	# Sagina japonica (Sw.) Obwi as S. maxima Grou
	# Sayina japonica (Sw.) Onwi as S. Indxinia Glay Stellaria alsine Grimm var undulata (Thunh.) Ohwi as S. uliginosa Murr. var
	undulata Fzl.
	S. aquatica (L.) Scop.

## Table 1 (continued). List of Plant Species

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# = plants listed in Porterfield'	s book, additions to original list in article series	
	S. media (L.) Cirillo	
Chenopodiaceae	Chenopodium album L.	
Convolvulaceae	Calystegia hederacea Wall.	
Cucurbitaceae	Melothria indica Lour.	
Euphorbiaceae	Euphorbia helioscopia L.	
Fabaceae (Leguminosae)	Astragalus sinicus L.	
	# Medicago minima (L.) Bartal.	
	# M. polymorpha L., as M. denticulata Willd.	
	Melilotus officinalis (L.) Lam.	
	Trifolium repens L.	
	# Vicia faba L.	
	# V. sativa L.	
	# V. tetrasperma (L.) Schreb.	
Lamiaceae (Labiatae)	# Ajuga genevensis L.	
	A. pygmaea A. Gray	
	Glechoma hederacea L, as Nepeta hederacea Trev.	
	Lamium amplexicaule L.	
	Mentha arvensis L.	
	Perilla frutescens (L.) Britt., as P. ocymoides L.	
	# Prunella asiatica Nakai, as P. vulgaris L.	
Ovalidação	Oxalis debilis Kunth, as O. martiana Zucc.	
Oxaliuaceae	O. corniculata L.	
Panavaracoao	# Corvdalis incisa (Thunb.) Pers	
Piporacaa	Houttuvnia cordata Thunb	
Piperaceae	Plantago maior l	
Flamaginaceae	Persicaria longiseta (de Bruyn) Kitag., as Polygonum caespitosum Blume var.	
Polygonaceae	longisetum Steward	
	Persicaria jucunda (Meisn.). Migo, as Polygonum jucundum Meisn.	
	Persicaria lapathitolia L. var. salicitolia Sibth., as Polygonum lapathitolium L. var. salicifolium Sibth.	
	# Rumex acetosa L.	
Portulaceae	Portulaca oleracea L.	
Primulaceae	# Androsace umbellata (Lour.) Merr. as A. saxifragaefolia Bunge	
Ranunculaceae	Isopyrum adoxoides DC.	
	Ranunculus acris L.	
	# R. japonicas Thunb.	
	R. pensylvanicus L.	
	R. ternatus Thunb.	
Rosaceae	# Duchesnea indica (Andr.) Focke	
	# Potentilla kleiniana Wight & Arn.	
Rubiaceae	# Galium aparine L.	
	Paederia scandens (Lour.) Merrill, as <i>P. foetida</i> L.	
Scrophulariaceae	# Lindernia crustacea (L.) F Muell., as Vandellia crustacea Benth.	
	Mazus miquelii Makino and M. stachydifolius (Turcz.) Maxim, as M. rugosus	
	Lour. and <i>M. stolonifer</i> Maxim.	

#### Table 1 (continued). List of Plant Species

LAWN AND ROADSIDE WEEDS	OF SHANGHAI	
# = plants listed in Porterfield's book, additions to original list in article series		
#	Veronica agrestis L.	
	V. persica Poir., as V. tournefortii Gmel.	
#	V. serpyllifolia L.	
Solanaceae	Physalis minima L.	
	Solanum nigrum L.	
Verbenaceae #	Verbena officinalis L.	
Violaceae #	Viola alba Besser	
	V. diffusa Ging. in DC.	
	V. japonica Langsd.	
	V. odorata L.	
	V. patrinii DC.	
	V. patrinii var. chinensis DC.	
Vitaceae #	Cayratia japonica (Thunb.) Gagnep.	

## Examples

Fortunately, Porterfield's articles are accessible in the relevant volumes of the *China Journal* (Shanghai), held by the University of Sydney and I present two of his descriptions and illustrations in full, as examples to show the quality and detail of his work.



Figure 1. Illustration of *Oxalis martiana* Zucc. [*O. debilis* Kunth.]

a. A leaf showing the long petiole partly hairy and the broad obovate leaflets

#### b. The tuberous rhizome

Stemless herbs with compound tuberous rhizome. Leaves radical, trifoliately compound, 6 cm. across. Leaflets broadly obovate-emarginate. Petioles 21 cm. long with scattered hairs below. Peduncles also radical and hairy, longer than the petioles, and bearing a cymose cluster of pale pinkish-purple flowers.

A common wanderer about the cultivated borders of the lawns having to be weeded continually from the violet beds. The petals are three times as long as the sepals, each of which have [*sic*] two small glands at the tip. (Collected Jun 28, 1931)

References: *Flora Hongkongensis* (Bentham, 1861), p. 56

Flora of Manila (Merrill, 1912), p. 265.

*China Journal*, vol. XVI, March 1932, no. 3, pp. 141, 142 (text)



#### Figure 2. Illustration of Lamium amplexicaule L.

- a. Long-petioled leaf of the lower part of the stem
- b. Seeds, enlarged
- c. Magnified view of nutlets maturing within calyx tube
- d. A cleistogamous flower enlarged
- e. A dissection of the same showing stamens
- f. Characteristic later flower

A decumbent annual with opposite rounded deeply crenate-toothed leaves, the upper ones clasping, the lower ones petiolate. Flowers purple, early ones cleistogamous; later ones with long corolla tube dilated at the throat, arched upper lip, spreading lower lip with truncate lateral lobes, the middle lobe notched and contracted at the base. Seeds splotched with white and black.

One of the early mints to spring up on the borders of the lawn. The first flowers do not open, are smaller, but, nevertheless, produce seed. (Collected March 12, 1932).

References: Gray's New Manual (Robinson and Fernald, 1908). p. 700.

China Journal, XVII, December 1932, no. 6, pp. 309 (text), 311.

# Conclusion

Porterfield's contribution to the knowledge of plants in the Shanghai area was considerable and made more effective by his contacts with other botanists. His first-hand observations of weeds are an important resource in the study of weed biology and history. He throws light on botanists poorly known, for example N. G. Gee (1876–1937), an early influential teacher of biology in China.

Porterfield's experience in China undoubtedly equipped him well for serving the CIA for a time during the Second World War (The New York Times, 1966).

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All reproductions have been credited to the original 1932 sources and are used here for educational purposes only.

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<sup>2</sup> A 36-page handout of a list given to all

participants at the 7<sup>th</sup> APWSS Conference in Sydney. Prepared from many sources by P. W.

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